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ABSTRACT

Guidelines for an entire school system to implement an outdoor education program in the 4th, 5th, and 6th grades are presented in this 1968 document. General and specific objectives are given, followed by concepts and suggested learning experiences for use in the areas of science (including living things, weather, and conservation), math, language arts, and health and safety. A sample itinerary for overnight camping experiences is given, along with items for the teacher to remember and suggested topics a teacher might cover to prepare the students for the camping experience. Game suggestions are listed for use in the cabin and camp, and supplementary materials to improve learning experiences in conservation education are provided. (AN)

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SWEET HOME CENTRAL SCHOOL DISTRICT # 7

1901 SWEET HOME ROAD
BUFFALO, NEW YORK 14221

OUTDOOR EDUCATION PROGRAM

FEBRUARY, 1968

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OUTDOOR EDUCATION PROGRAM

REPORT FROM THE OUTDOOR EDUCATION COMMITTEE

The following pages contain suggested guidelines for a system wide Outdoor Education Program. This document is not meant to be a scope and sequence or should it be treated as a rigid curriculum. It is a guide which can be used by Building Administrators and Teachers as a basis for an Outdoor Education Program.

Further, the Outdoor Education Committee believes that a successful Outdoor Education Program has the following values:

1. It promotes a healthy attitude toward outdoor living.

2. It emphasizes the importance of conservation.

3. It assists in the development of appropriate social behaviors.

4. It provides firsthand experiences with nature and the outdoors.

5. It correlates various areas of the curriculum.

6. It provides another dimension in which teachers can learn to know and understand students.

OUTDOOR EDUCATION COMMITTEE

Kenneth Fournier, Chairman
James Crawford
David Ebert
Mrs. Judith Hirschberg
Miss Joyce Masi
William Pickard

SWEET HOME CENTRAL SCHOOL DISTRICT

OUTDOOR EDUCATION PROGRAM

GENERAL OBJECTIVES

1. To effect learning through direct experience by utilizing all the senses.
2. To use the outdoors to augment the classroom by providing additional motivation.
3. To use the out-of-doors as a resource for education.
4. To provide learning opportunities for the majority of children.
5. To use living, learning, and playing out-of-doors as a safety valve for modern living (as a means of venting excess energy and frustration).

SPECIFIC OBJECTIVES

FOURTH GRADE

1. SCIENCE
   - A. Living Things
     SUGGESTIONS: Teacher should teach the scientific method to children in preparation for outdoor education experiences. Adequate planning should take place involving observation and experimentation.
     1. Observation of plants and their environment.
        - a. Recognize common plants
        - b. Use of roots, stems, leaves
        - c. How plants grow
        - d. Sketch parts of flowers as seen
        - e. Topography where various plants are found

   - B. Weather
     1. Forms of precipitation
        - a. rain
        - b. snow
        - c. sleet, hail
     2. The water cycle - moisture in air
     3. Condensation and evaporation

   - C. Conservation
     1. What is it?
     2. Observe ways farmers practice conservation
        - a. Crop rotation
        - b. Strip cropping
     3. Examples of water and wind erosion
     4. Safety precautions dealing with conservation (building a campfire)

continued. . .

Specific Objectives continued

I. SCIENCE

D. Astronomy

1. How to use a telescope
2. Observing planets
3. Observing satellites
4. Observation of constellations
5. To recognize that the various colors of stars indicate temperature differences

E. Geology

1. Different types of rocks
   a. Sedimentary
   b. Metamorphic
   c. Igneous
2. How to identify minerals
   a. Color
   b. Hardness
   c. Weight
   d. Acid

II. MATHEMATICS

A. Figure cost per person for trip
B. Measure distance to and from camp
C. Construct a scale map of camp site
D. Estimate price of cookout

III. LANGUAGE ARTS

A. In spelling, maintain a vocabulary list of words used at camp.
B. Compose a letter to the camp asking for permission to visit.
C. Taking notes of various observations.
D. Preparing oral reports on experiences.
E Creative writing.

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FIFTH GRADE

I. SCIENCE

A. Living Things - Plants

1. Agents in pollination of plants
   - a. insects
   - b. wind
   - c. people
2. Purposes for the different parts of the flower
   - a. stamen
   - b. pistil
   - c. corolla
   - d. petals
3. Edible and poisonous plants
4. Make a terrarium

B. Animals

1. Make an aquarium
2. Look for animal lairs and trails

C. Weather

1. Observe cloud formation
2. Temperature changes
3. Wind conditions
4. Compute hours of sunlight
5. Demonstrations using thermometer, rain gauge, barometer
6. Follow-up by constructing various weather instruments
7. Learn the types and names of the clouds and the weather they predict
   - a. cumulus
   - b. cirrus
   - c. stratus
8. What is air pressure and how does it affect temperature
9. Making weather maps

D. Conservation of Natural Resources

1. Water
2. Mineral
3. Wildlife
   - a. To develop an appreciation of wildlife
   - b. Conservation of wild life
     1. Homes
     2. Food
        - a. berries
        - b. insects
        - c. fruits
   - c. Protection of fish and wildlife by hunting and fishing laws
   - d. To understand that conservation of soil, water, plants and animals is closely interrelated such as conserving birds that eat insects
4. Human
   - a. How can city people conserve resources

continued...

I. D. Conservation of Natural Resources
   5. Soil
      a. Utilization of land forms (farming)
      b. Effects of errosion
         (1) gullies
         (2) rivers
         (3) valleys
   6. Forests
      a. How does wild life help trees, plants, soil

   E. Astronomy
      1. Name parts of telescope
         a. concave lens
         b. convex lens
      2. Finding direction at night by use of star (North)
      3. Observe phases of the moon
      4. Visit Planitarium

II. MATH
   A. Find circumference and diameter of trees
   B. Dimentions of camp buildings (area - perimeter)
   C. Pacing distance in hiking
   D. Distance in a hike
   E. Estimate age of tree

III. LANGUAGE ARTS
   A. Creative writing - description of scenery, write poems
   B. Keeping notes of what they see in fields
   C. Write reports on observed scientific concepts
   D. Write an imaginary story about what they expect from camp

###

SIXTH GRADE

I. SCIENCE

A. Living Things

1. Drawing and classifying animals
2. Seeing complete and incomplete metamorphosis
3. Make casts of animal prints
4. Finding different types of feathers on a bird
5. Bringing back samples of water and viewing them under microscope
6. Observe three parts of the insect
7. Observe old and new forest growth
8. Listening to and identifying night sounds

B. Weather

1. Change of weather due to cold and warm fronts
2. Refer to 5th Grade guide

C. Conservation

1. Observe examples of erosion
   a. breakage
   b. smooth rocks
2. Test for types of soil
3. Test for hard and soft water
4. Studying the eroded areas at camp
5. Look for opening in bark
6. Look for insect homes
7. Observing types of streams

discuss the total importance of all conservation areas (see Grade 5, item D.

II. MATH

1. Fractions in planning menus and recipes

III. LANGUAGE ARTS

1. Dramatizations
2. Planning the program
3. Label and identify specimens
4. Compose a booklet of all information gathered
5. Storytelling
6. Use of camp vocabulary
7. Reporting
8. Creative writing

IV. HEALTH AND SAFETY

A. Personal Hygiene

1. Taking proper care of clothing
   Dressing according to occasions and activity
2. Personal cleanliness
3. Keeping camp area clean

continued...

IV. HEALTH AND SAFETY continued

B. Safety

1. Use of safe camping practices
2. Proper instructions as to the building of fire places and their proper usage
3. How to hike properly
4. The use of the buddy system
5. The uses of first aid
6. Make a First Aid Kit.

V. SUGGESTED ACTIVITIES - see Camp Games attached

RECOMMENDATIONS

A. The 5th and 6th Grades should have an overnight camping experience. The 4th Grade should have an away Field Trip with no overnight.

B. The purchase, by the school district, of property to be used as an Outdoor Education Camp.

C. The use of pre-camping field trip.

D. Proper pre-trip planning in the classroom to relate to camp experience. (pupil-teacher planning)

E. The utilization of special area teachers to complement and assist the Outdoor Education Program.

F. The formation of an inservice workshop.

G The Board of Education should allocate monies through the building budget to carry out the program.

The following are activities taken from present Outdoor Education Programs which should be helpful in planning an Outdoor Education Program.

* *

SUGGESTED ITINERARY FOR OVERNIGHT CAMPING EXPERIENCES

FIRST DAY

9:30 A.M.	leave school, observe route, towns, trees, conservation practices, animals, and other rural sites
11:00 A.M.	approximate - arrive and unpack
11:15 A.M.	prepare lunch over fire (wood, fire, eat, cleanup)
1:00 P.M.	bunks assigned, made - review rules of camp
1:30 P.M.	assemble in groups for first hike (approximately 1-1/2 hours)
3:00 P.M.	assemble in groups for second hike (approximately 1-1/2 hours)
4:30 P.M.	free time, clean up for supper
5:30 P.M.	supper
6:30 P.M.	scavenger hunt (prizes)
8:00 P.M.	campfire (skits, stories, songs, marshmallows, etc.)
9:30-10:00	relaxation, snacks, etc. in preparation for bed
10:00 P.M.	lights out

SECOND DAY

7:00-7:30	reveille
8:00 A.M.	breakfast
8:45 A.M.	packs up
9:00-10:15	morning hike
10:15-11:00	sports activities
11:00-11:30	summation of experiences
11:30 A.M.	lunch
12:15 P.M.	preparation for home

Desirable educational background material in preparation for camping experience.

* *

1. Basic foods
2. Fire Building
3. Safety - First Aid, directions (compass) etc.
4. Collecting - materials and techniques
5. Identification - tracks, birds, rocks, plants, insects, etc.
   charts, books (other materials)
6. Conservation - practices
7. Care of personal clothing and equipment
8. Camping conduct and behavior
9. Geology
10. Water Study
11. Astronomy
12. Develop Vocabulary - to be utilized for the above

- -

THINGS FOR TEACHER TO REMEMBER

whistle	raincoat
boots	first aid kit
prizes for scavenger hunt	knife
flashlight	earplugs
toilet articles	matches
newspaper	sports equirment
pencil and small notebook	

CAMP GAMES

A. Cabin or Unit Games

1. Rhythm

When: On rainy days or to quiet the campers down before rest period or bedtime.

Where: In the cabin or outdoors.

How: Have the campers sit in a circle, and have one camper leave the room. One of the campers in the circle is designated to be the leader, and he leads the rest of the circle in some motions, changing the motion whenever he feels it is safe. The camper who left the room comes back and has to guess (three guesses) who the leader is. The leader then becomes the one to leave the room and a new leader is choosen.

2. Relays

When: When campers are getting out of hand or when they seem to have a lot of energy and just want to "let loose." The relays may be used for individual cabins, for units, or for a game night.

Where: Usually out-of-doors.

Object: The object of a relay may be to get an object or objects to a designated goal line by means of passing or handling to a member of your team or group.

Type: Tin Can Relay

Equipment: Tin cans and brooms

How: There are two to four lines in file formation behind a designated line or mark. A goal (distance varies according to the age and ability of the campers) is picked and the campers must hit the can with the broom all the way down to the goal and back to the next person. The team finishing first is the winner.

Type: Bounce - Pass Relay

How: This game can be played with as many groups as is desired. There are from 8 to 10 players on a team. Each player must bounce the ball and pass it over his head to the player behind him. The last person in line gets the ball and runs and gives it to the first person in line, the one who started the relay. The first team to finish is the winner

3. Usually any game used in gym classes can be used at camp. However, due to the amount of space available, the counselor should be able to change the rules a little to make it more exciting.

B. Camp Games

1. Treasure Hunt

When: After supper and usually before it gets dark.

Where: On the camp grounds.

Equipment: Clues and a prize or treasure.

How: The camp is usually divided by cabins and each cabin is given a certain color of paper on which all of their clues are placed. Their clues are scattered throughout the camp area and each one leads to the next, with the final clue leading to the treasure. The cabin first to the clue (final) or treasure is the winner.

B. Camp Games

2. Scavenger Hunt

When: For an evening program after dinner

Where: Over the camp area

Equipment: A piece of paper for each cabin with the list of the things to be found by them.

How: Each cabin is given a list of items to be found and brought to a central place. These may include snakes, worms, shoes, sea shells, branches, nylons, shorts, and many more such items. A time limit is set, and the cabin which has the most and best items is the winner. Sometimes each item is given a certain amount of points, and the cabin with the highest number of points wins.

3. Game Night

When: For an evening program

Where: On an open area in the camp

Equipment: The equipment that is necessary for each individual game.

How: There should be as many different games as there are cabins. The counselors that do not have cabins during that period should lead the games and the cabin counselors should lead their campers to the different games to keep them under control. A time limit is set for each round, and when the whistle blows, or the signal is given, the cabins move to the next game.

This is good for a change of pace in the evening program. These games may revolve around a theme or they may not. An example of one that revolves around a theme is the following:

Theme: The 12 Months

Winter-January: Have teams and each team must complete a picture of winter having each camper drawing something different.

Valentines - Feb: Have the campers toss bean bags through a board with holes in it, which are decorated with hearts.

Wind:- March: Ping pong blow

Rain - April: Have campers throw wet sponges at the counselors

Flowers - May: Relay games using flowers

Summer - June: Any game

Sports - July: Javelin throw with straws, discus throw with paper plates

Anything-Aug.: Steal the bacon or swat

Hockey - Sept.: Tin can hockey

Columbus Day-Oct.: Have a dressing race - dressed as Columbus

Thanksgiving - Nov.: A game for Thanksgiving

Christmas - Dec.: A game for Christmas

C. Other Games

1. Nature Games:

Nature games depend on alertness, observation, and identification. It is used to emphasize nature, rather than to teach it. This game is usually used on a hike:

While walking or hiking, the group usually goes in a single file. The person at the head of the line is asked to identify some object such

continued....

C. Other Games continued...

as a tree, shrub, flower, bird, or animal track. If he does so correctly, he maintains his position at the head of the line, if he fails, he goes to the end of the line. The person to stay at the head of the line the longest is the winner.

Nature Sounds - This type of game can be played around the campsite or on a hike. Everybody stops and keeps perfectly silent for five minutes. Each person lists all the sounds he has heard. The person with the longest list is the winner.

2. Night Games:
A treasure hunt at night with flashlights is a lot of fun. If it has been well-planned in advance, it should be easier to find the clues and should take less time than a daytime hunt. Each group should be small, not more than ten campers, accompanied by a leader.

3. Indian Wrestling:
This is done in couples. The opponents put their hands on each others shoulders...while lying flat on the floor or ground. On the count of one, raise your inside leg and lower it. Do the same for the count of two. On the count of three, lock legs with your opponent and try to pull him over. The one who pulls the other one over is the winner. This is commonly known as leg wrestling.

4. Drake Fight:
Two contestants face each other about four feet apart. Each grasps his ankles and by butting, tries to make your opponent lose his balance. Best out of three wins.

STUDY OF A FARM POND

Date _____ Time _____ Weather _____

Temperature of air _____

Temperature of water _____

Is this pond natural or artificial? _____

How does this pond get its water? _____

How deep is the water near the edges? _____

What is the greatest depth? _____

Take a water sample in a glass container. What is the color of the water? _____

_____ Is it cloudy or clear? _____

What kind of bottom has the pond? Sand _____ Gravel _____ Mud _____

What kind of edge does the pond have? Rocky _____ Gravelly _____

Sandy _____ Covered with plant growth _____

Look at the slope of the banks. Is it gently sloping? _____ Is it steep? _____

Is the watershed around the pond covered with plant growth? _____

Is it bare? _____

What difference does this make to the water of the pond? _____

What plants do you see growing in the shallow water near the rim of the pond?

_____

Are there any plants growing entirely under water? _____

You will notice there are no floating plants in this pond. On some ponds you will see a green scum. This is a plant called fresh water plankton. Many water animals feed on it. Collect one jar of pond water so that the tiny plant and animal life in it can be studied under the microscope. A pond is booming with life! Watch for whirly-gig beetles. These are small black and very active creatures that usually sim together in groups and make a great ripple on the water. Another water creature can be seen swimming under-side up on

Study of a Farm Pond continued.....

the top of the water. The up-side down insects are called backswimmers.

The shores of the pond are the home of dragon flies and damsel flies. In their early stages dragon flies and damsel flies are called nymphs. At that time they do not look much like grown-up dragon flies or damsel flies. Nymphs live in the water and scoop up food from the pond.

Another insect of the pond has long legs on which it walks or strides over the top of the water without breaking through. This insect is a water strider.

SOME FACTS ABOUT WATER

Covers about 3/4 of earth's surface.

770 times heavier than air.

Has a surface film stronger than any other liquid except mercury.

Water has more supporting power than air because it is more dense.

Water does not get so hot or cold as air. It is a poor conductor of heat and therefore does not heat as fast or cool as quickly as air.

As the pond water cools the top water falls a little; as it cools more, cold water drops farther down in the pond and gradually forms a bottom layer. Warm water rises to the top and takes the place of cool.

Water is heaviest when it cools to 39.2'.

When the surface water freezes at 32' the pond is covered with a blanket which holds in the heat of the water and prevents it from radiating into the air.

Water absorbs oxygen from the air so that there is more oxygen near the surface than deeper down.

Plants in the water, when making food, take in carbon dioxide and give off oxygen. This must take place in the light. At night plants give off carbon dioxide. There is more carbon dioxide in ponds in winter than summer because plants use less in making food.

Water and air are both transparent but water is less transparent than air. It lets sunshine in upon the green plants which use it in making food.

Light penetrates thru many feet of water.

SCAVENGER HUNT

TRY TO FIND AS MANY OF THESE ITEMS FOR YOUR GROUP AS YOU CAN.

1. a pine needle _____
2. a spruce needle _____
3. an apple leaf _____
4. a feather _____
5. some fur _____
6. pod of milkweed _____
7. an acorn _____
8. a pine cone _____
9. a buttercup _____
10. one insect _____
11. an old bone _____
12. several kinds of grass _____
13. some clover _____
14. one sugar maple leaf _____
15. some gnawed fruit _____
16. a cacoon _____
17. goldenrod _____
18. piece of sandstone _____
19. some berries _____
20. a water bug _____
21. a strawberry plant _____
22. an apple _____
23. a compound leaf _____
24. four other kinds of leaves _____
25. list birds seen or heard _____

Have your leader check your items. Have fun finding your specimens, and see how much you can learn on this nature hunt.

Aids in identifying leaves and bark of certain trees: (To be used in addition to the tree key)

LEAVES

1. Hemlock -- A flat spray of dark green foliage. It is blue on the back and has white lines on the back.
2. White pine -- 5 needles (One for each letter - W H I T E).
3. Scotch pine -- Needles twisted. 2 to a bundle. They are difficult to break. "A Scotchman is never broke."
4. Red pine -- 2 to a bundle. Needles break easily.
5. Red maple -- Notches are pointed - but not deeply cut. Leaves "go steady". They are never without a partner.
6. Sugar maple -- 5 veins. "U" shaped notches. Has less than 25 teeth.
7. Goosefoot maple -- Leaf is shaped like a goose's foot. It has fruit on it sometimes.
8. Witch hazel -- In the fall it bears fruit.
9. Large toothed aspen -- It has flat stem and sharp "teeth".
10. Beech -- It has a tooth for each vein. "A tooth for each is a sign of a Beech."

BARK

a. White ash -- diamond shaped bark
b. Black or cherry birch -- not curly bark
c. American beech -- smooth, gray bark. Has "mustache".
d. Black cherry -- "flaky bark".
e. Shadbush -- stripes are persistent for 6 - 8 inches.
f. Yellow birch -- yellow brownish bark - peels off.
g. Iron wood, Hop Hornbeam -- bark shaped like train tracks. "Hop a train."

FLOWERS, TREES, AND FERNS IN EVIDENCE

FLOWERS

Jewelweed (pale touch-me-not)
Solomon Plume (deep red berries)
Jack in the Pulpit (bright red berries
Yellow Bead Lily (dark blue berries)
Cucumber Root (blue berries)
Canada Violet (berries)
White Baneberry (white berries on red stalk
Wood Sorrel
Evening Primrose
Partridge Berry (leaves only)
Boneset
Joe-Pye Weed
Goldenrod (several kinds)
Asters (several kinds)
Queen Anne's Lace
Chickory
Hawk Weed (Devil's Paint Brush)
Burdock

TREES

Locust
Beech
Maple
Basswood
Hophornbeam
Yellow Birch
Apple
Cherry
Ash
Quaking Aspen
Witch Hazel
Hemlock
Red Pine

FERNS

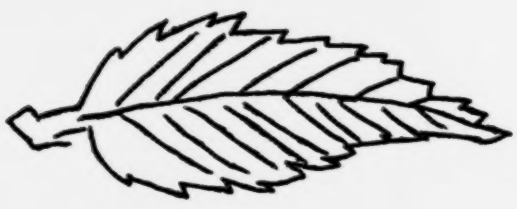
Sensitive
Woodfern (several kinds)
Christmas

Locust - Alternate compound, smooth edges, silvery underneath

Beech - Heavy veins, toothed

Basswood (Linden) - Large heart-shaped, veiny, rough leaves

Maple - palmate, opposite leaves

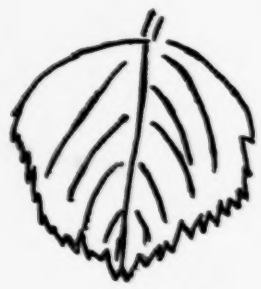


Hophornbeam - toothed leaves

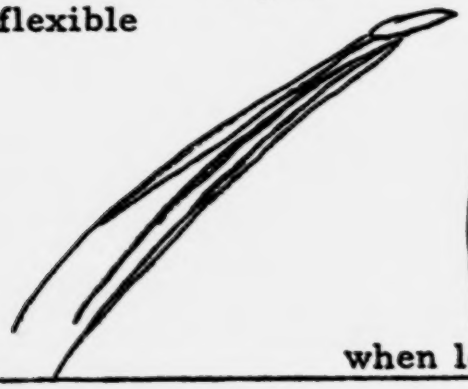
Yellow birch - nearly oval, double-toothed, 3-4in. long, paler below, wintergreen odor

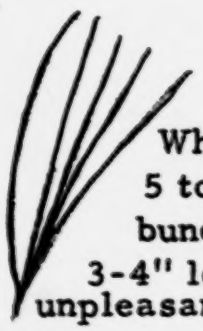
Ash -compound opposite leaves, seven oval leaflets, dark green above, paler, silvery below, irregular blunt teeth

Aspen (quaking) almost round, simple alternate, quako (wiggle) in slightest breeze



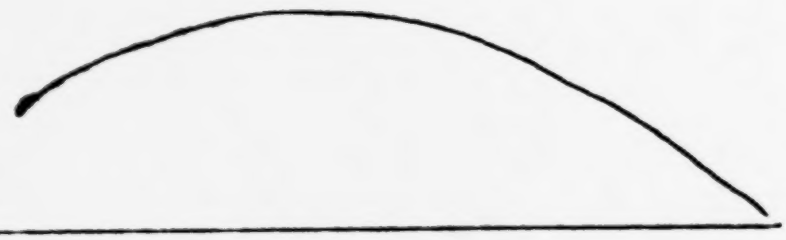
Longleaf Pine - 8 - 20 in. length, flexible





White - 5 to a bundle 3-4" long unpleasant odor when leaves are crushed

Japanese Larch

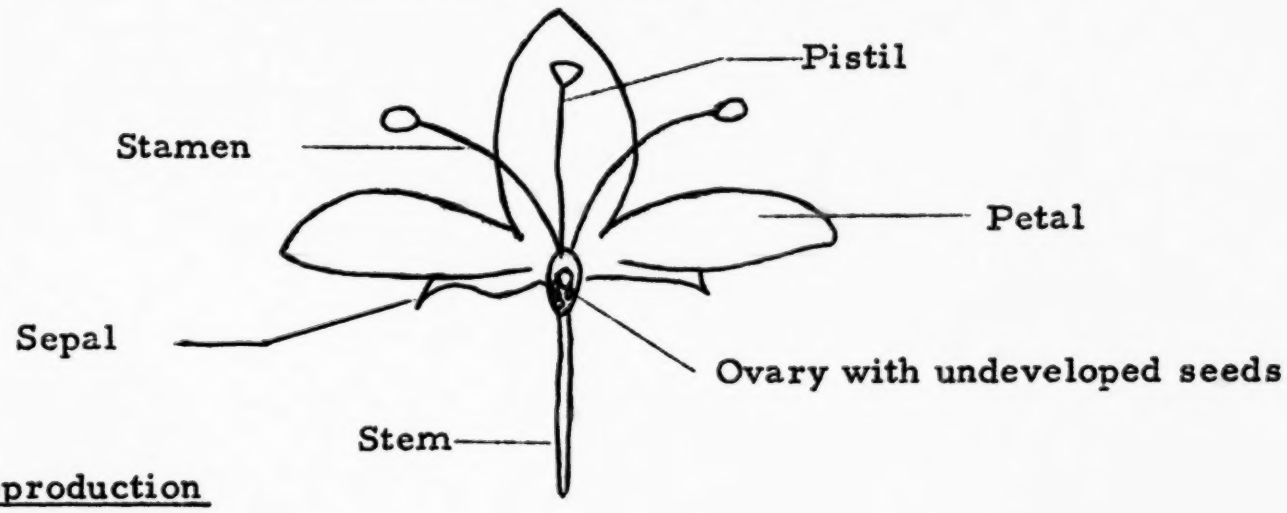


WILDFLOWERS AND WEEDS

Weed or flower - What is a weed? A plant that grows where you don't want it to.

I. Identification of parts and functions

A. Petals - provide bright colors to attract insects
B. Leaves - carry on photosynthesis. This is the process of making of food from carbon dioxide and water in the presence of light and the substance that makes plants green - chlorophyll
C. Stems - carry water from the roots to the leaves
D. Roots - anchor plan to ground and absorb water
E. Sepals - outermost circle of leaves, usually green. They protect the inner-parts of the flower in the bud.
F. Calyx - the sepals together are called the calyx
G. Stamen- carry pollen
H. Pistil - receives pollen
I. Ovary - the bulb like structure at the base of the petals where undeveloped seeds are produced.



II. Reproduction

1. A. Undeveloped seeds are produced in the ovary of the flower.
B. The pollen, which is contained in the stamens, falls upon the pistil.
C. A pollen grain, provided it is from the same species of plant, sends a tube down the pistil to fertilize a seed.

2. How are flowers pollinated?
A. Pollen is carried from one flower to another by the wind, by insects, by water or by birds.
B. Some plants are self pollinated. That is, a blossom's own pollen falls on the pistil of the same flower.

Some plants have the stamens and pistil in the same flower, some have them on separate flowers on the same plant, and some have them on separate plants.

WILDFLOWERS AND WEEDS continued.....

II. 3. Seed Dispersal: When the seeds are ripe, they must be distributed so that new plants can begin growth from them. This is done in a variety of ways.
   a. wings - such as on the maple tree
   b. plumes - dandelion, milkweed
   c. spines and barbs - carried by man and animals
   d. air spaces and corky floats - carried by water
   e. explosive seeds that burst open

4. Reproduction by spore. Plants such as fungus, moss, mushrooms, and ferns that do not have flowers, reproduce by means of spores. Spores are seeds so tiny they are invisible to the human eye, and appear as dust when one touches the plant. If you examine the back of the leaves of a fern you may see the brown spore cases. They are the "flowers" of a fern.

III. How Do Plants Pr[illegible]ct Themselves?
   1. touch stems
   2. many seeds and excellent methods of spreading seeds
   3. many spores
   4. spines, stings, and poison (see below)
   5. wide-spreading and deep roots

IV. Poisonous Plants: There are only 3 kinds of plants poisonous to the touch that you may find in this area. Poison Ivy is the most common. Some plants produce berries that are poisonous when eaten, so never eat any berries or fruit that you cannot definitely identify.

Poison Ivy

Poison Sumac

Poison Oak

WILDFLOWERS AND WEEDS continued....

V. Identification of Kinds: When trying to identify wildflowers and plants you find, take notice of the following things and then use a good guide book.

1. Relation to the habitat - Does the plant grow where it is dry? Where it is swampy? Bright sunlight? Shade? Rich woodland ground? Sand?
2. Color of flowers
3. Single flower on a stem or many small ones?
4. Arrangement of pistils and stamens
5. Are there any seed pods, berries, etc.?
6. Color of leaves and stem - Light or dark? Spotted?
7. Kind of leaves - simple or compound? If compound leaf, are the individual leaflets alternate or opposite? Are the leaves entire, toothed or lobed?

VI. Flowers and Plants to Look For at Camp

1. Jack-in-the-Pulpit
2. Partridge Berry (leaves only)
3. White Violet
4. Yellow Violet or Adder's Tongue
5. Burdock
6. Dock (Wild Coffee Plant)
7. Chickory
8. Trillium (White and Purple)
9. Foam Flower
10. Queen Ann's Lace (leaves only) blooms in fall
11. Goldenrod (leaves only) blooms in fall
12. Indian Pipes
13. White Mullen
14. Wild Teasel
15. Self-Heal
16. Marsh Marigold
17. Solomon's Seal
18. False Solomon's Seal
19. May Apple's (Wild Mandrake)
20. Bloodroot
21. Dutchman's Breeches
22. Fungus
23. Ferns
24. Moss
25. Toadstool and Mushrooms
26. Butter and eggs
27. Milkweed
28. Tall Buttercup
29. Dandelion
30. Plantain - Broad leaved and narrow leaved
31. Clover

METHODS OF MOUNTING LEAVES AND MAKING PRINTS

Make the cast of a leaf this way:

1. Find a cardboard box large enough so that the leaf can lie flat in it.

2. Put a layer of modeling clay in the bottom of your box.

3. Press the leaf down into the clay. Remove the leaf.

4. Then mix a cupful of plaster of Paris, with enough water to make a thick paste. Pour this paste into the box.

5. Let it stand until the plaster of Paris is hard. Then take out the block of plaster of Paris. The block should have a cast of the leaf on the under side.

6. You may paint the cast of the leaf with green watercolor paint after it is dry.

CONSERVATION

I. WHAT IS CONSERVATION?

A. Conservation means the protection and wise use of our natural resources - soil, water, forests, minerals and wildlife.

II. WHAT ARE THE EIGHT CHIEF KINDS OF CONSERVATION?

A. Soil Conservation
B. Water Conservation
C. Forest Conservation
D. Wildlife Conservation
E. Conservation of Grazing Lands
F. Mineral Conservation
G. Conservation for Recreation
H. Conservation of Human Resources

III. WHAT IS THE BALANCE OF NATURE?

A. An example is the balance of nature between soil, water and wildlife. Plants and animals only "borrow" the foods they need. When they die and decay, they give the elements they have used back to the soil. There is the need to conserve these plants and animals in their natural habitat in order to keep this balance of nature.

IV. WHAT IS CAUSING THIS URGENT NEED FOR GOOD CONSERVATION PRACTICES?

A. Soil erosion
B. Pollution of streams from city sewage, garbage, and factory waste.
C. Depletion of our American forests by misuse and carelessness.
D. Draining of ponds, swamps and wet lands by the farmer because of his desire to grow more crops.
E. Extinction of many of our birds and animals due to hunting and trapping, thus upsetting the balance of nature.
F. Many species of wildflowers have disappeared altogether due to wanton pulling of blossoms and plants.

V. WHAT ARE SOME EVIDENCES OF CONSERVATION THAT WE MAY SEE ON OUR TRIP TO CAMP

A. Contour plowing, terracing
B. Planting of grass, clover, and other thick-growing vegetation on land suited to pasture, but too steep for crops
C. Farm ponds
D. Christmas tree planting on land that is suited for woodland
E. Bird feeders and shelters
F. Cover crops planted by state along roadside to prevent erosion

CONSERVATION continued...

VI. WHY IS THE BEAVER IMPORTANT IN THIS CONSERVATION STUDY?

A. He is an engineer who lives and works on streams.
B. Beaver pond provides safe homes for other wild creatures such as muskrats, fish, ducks and geese.
C. Beaver pond helps to prevent floods.
D. After beavers have eaten the bark from the trees near their pond they move to a new location. The dam gradually breaks, the pond dries up, and there is left a meadow of rich soil.

VII. HOW CAN WE BECOME CONSERVATIONISTS DURING OUR STAY AT CAMP?

A. By following these rules set up by the U. S. Forest Service

1. Be sure your match is out. Break it in two before you throw it away.
2. Build a safe campfire.
   a. Scrape away all leaves, grass or pine needles from a spot five feet wide.
   b. Keep your fire small.
   c. Never build it against a tree or log or near a bush.
3. Do not leave a fire untended.
4. Put out your fire completely when you leave.
   Wet the ground around the fire.
   Be sure the last spark is dead.

B. By not littering.

C. By not upsetting the balance of nature.

D. By not carelessly tramp*ling through* or pick*ing* wild flowers.

CONSERVATION continued...

Conservation practices to look for going to and at camp

1. Reforestation
2. Check dams
3. Human helps for animals
4. Terracing
5. Contour plowing
6. Mulching
7. Danger signs for campers, smokers and hunters
8. Cover crops
9. Strip cropping
10. Woods thinning (selective cutting)
11. Farm ponds
12. Run off ditches
13. Pollution control (industry and individual)
14. Restocking streams, ponds and lakes
15. Indications of hunting laws
16. Brush piles
17. Bird houses
18. Stream banking

HOW CAN WE PRACTICE HUMAN RESOURCE CONSERVATION?

Look for examples of:

1. Sheet erosion
2. Silting
3. Gulley erosion
4. Bank erosion
5. Wind erosion

WEATHER OUTLINE

I. OBJECTIVES

A. To help the students learn the various simple methods of keeping weather records.

B. To help the student become acquainted with reading and recording weather data.

C. To give the student a basic conception of the importance of weather to man.

D. To help the student observe present weather.

E. To help the student predict simple weather movements.

II. PROCEDURE

A. Set up simple weather station to record present weather
1. temperate and dew point
2. pressure
3. cloud coverage
4. wind velocity
5. wind direction
6. to measure precipitation if any

B. Record hourly observation on prepared weather data sheet.

C. To interpret and analyze the data recorded.

III. CONCLUSION

To give the student an understanding of weather and its affect on us, the community, and our state.

IV. MATERIALS

A. Aneroid barometer
B. Wet and dry bulb thermometer
C. Cloud charts
D. Wind Chart
E. Direction indicator (compass)
F. Shelter to obtain accurate data
G. Rain gauge

ANIMAL TRACKS

SOME COMMON ANIMAL TRACKS - HOW TO RECOGNIZE THEM

CHIPMUNK

Right Front

Right Hind

GRAY SQUIRREL

Right Front

Right Hind

ANIMAL TRACKS CON'T.

OPOSSUM

Right Front

Right Hind

SKUNK

Left Front

Left Hind

RED FOX

Right Hind

ANIMAL TRACKS CON'T.

RED SQUIRREL

Right Front

Right Hind

COTTONTAIL RABBIT

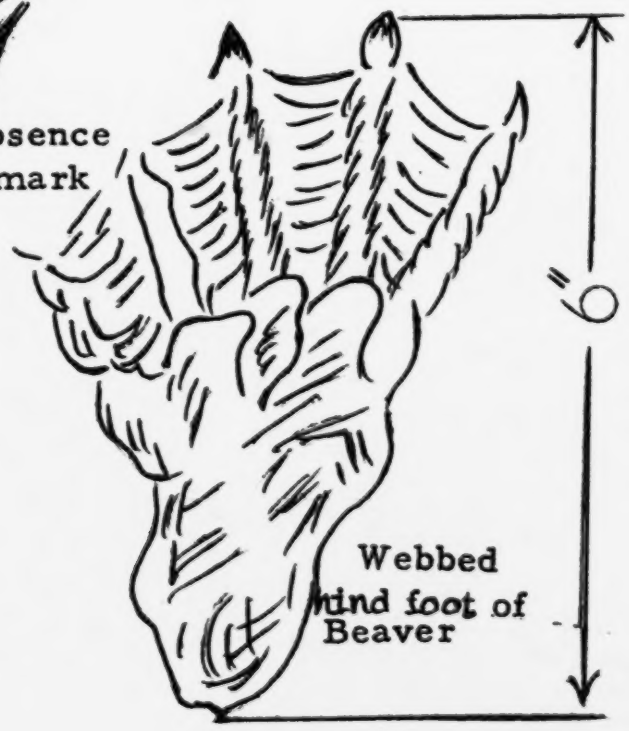
Front

Hind

Note absence of claw mark on 2nd toe

BEAVER

When walking will show mark of tail drag



Webbed hind foot of Beaver

ANIMAL TRACKS CON'T.

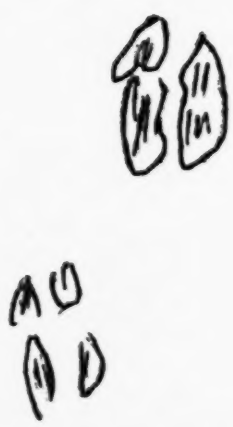
RACCOON

Right Front

Right Hind

WHITETAIL DEER

Whitetail Doe Track, Life Size



Deer Walking

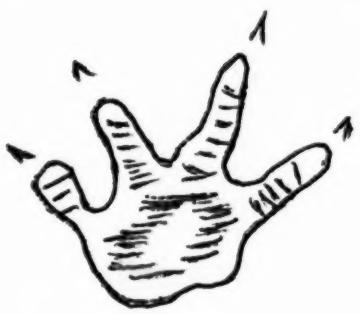
Bounding

ANIMAL TRACKS CON'T.

DEER MOUSE

Hind

Front



FIELD MOUSE

Right Front

Right Hind

WATER STUDY

I. Characteristics of Water
   a. Expands
   b. Contracts
   c. Soluable
   d. Seeks its own level
   e. Compressable

II. Forms of Water
   A. Liquid
   B. Solid
   C. Gas

III. Rain
   A. Forms around
   B. Contains

IV. What becomes of Rain
   A. Ground Water
      1.
   B. Water Table
      1. forms when
   C. Marshes
   D. Swamps
   E. Springs
   F. Artesian Wells
   G. Subterranean Streams
   H. Absorbed by trees, plants
   I. Run-off into streams

V. Water Erosion
   A. Bombarding effects of dripping water
   B. Acts as a carrier of minerals
   C. The action of expanding ice
   D. The grinding effects of glaciers
   E. Carries sediment into streams and harbors
      a. reduces amount of water the stream can hold
      b. covers over food for fish
      c. deposits on gills of fish

VI. The Water Shed

VII. The Water Cycle
   A. What it is
   B. How it fits into our water study

VIII. Soil and Water Conservation
   Conservation means using the land in the wisest way so that neither wind nor water can destroy it.

continued...

WATER STUDY continued...

VIII. A. Best use of steep land
1.
2.
B. Best use of level or gently sloping land
1.
2.

IX. Conservation Farming
A. Contour plowing - around hills
1. Keeps water from running downhill
B. Terracing
1. Wide ridges of earth left at certain places on hill
a. catches water and holds it.
2. Plant close growing crops
a. clover
b. grass
C. Rotation of Crops
1. Changing of crops grown on a certain field from year to year
a. prevents some minerals from being extracted from the soil.
D. Graze Pastures Carefully
1. Control the number of cattle or sheep in the pasture
E. Saving the Forests
1. Prevent forest fires by lightning and campers
2. Remove diseased trees
3. Protect from insects
4. Harvest the trees wisely

X. Water at Work
A. For People
1. In U.S. we use 180 billion gal. of water per day
2. Most cities supply 150 gal. per person per day
3. Discuss ways used
B. For Industry
1. Food Canning factories
a. washing and preserving food
2. Textile Manufacturing
a. for bleaching cloth - 37 gals. of water for 1 lb. cloth
b. for dying cloth
3. Paper Manufacturing
a. washing and boiling wood pulp - 20 gals. of water to produce 1 lb. of paper
4. Other Manufacturing Plants
a. For cooling moving parts of machinery
b. Refrigeration machin es
c. Heating systems
d. Air conditioning buildings
e. Generating hydro-electricity
5. Manufacturing Synthetic Rubber
e. 1300 gals. of water to produce 1 lb. of rubber

WATER STUDY continued...

X. C. For Plants
- a. Food for plants must be dissolved in water
- b. Water for food passes into the leaves into tiny air spaces in leaves
- c. Water diffuses through pores on leaves

D. Water contents of plants
- a. Cabbage 90%
- b. Carrots 85%
- c. Corn 80%
- d. Potato 79%
- e. Spinach 90%

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WHERE TO LOOK FOR INSECTS

Insect life is abundant wherever one looks. This is only a list of collecting suggestions which is not exhaustive. Some good detective work will locate many insects in the places listed and in many others.

1. Look under stones and boards and be sure to turn them back to their original position when through, so they will be ready again. This collecting is good in the spring and early summer.

2. Beetles and many other insects may be found under loose bark on logs and stumps.

3. Rotten wood is a good place to look for insects.

4. The wise collector gets his share of flying insects on warm days in early spring and late fall.

5. Keep a net in good condition and use it for butterflies; it is usually best to wait until they settle.

6. If you prowl around at night with a flashlight, you will be surprised at the number of insects that are prowling around, too.

7. On very warm nights, the street lights attract many insects, and you can often find rare ones, too.

8. Put plant galls and infected pieces of wood in insect tight containers and examine from time to time for the insects that come out.

9. Collect pupae and watch for the adults to emerge. Winter is a good time to collect many pupae.

10. Look for lady beetles wherever you see a plant with aphids or scale insects.

11. Bees, flies, and other insects may be found wherever trees are shedding their sap.

12. Tiger beetles may be found on a warm and dry sandy bank.

13. Stem borers may be found if the stems of dry or green weeds and other plants are split.

14. Flour bins, granaries, and wherever cereals are kept will bring grain feeding insects.

15. Look at flowers for every kind of insects that may be hiding in them.

16. The domestic animals in the pasture collect many kinds of flies.

17. With a fine net, catch the insects you can see swimming in the water.

A STUDY UNIT FOR BIRD IDENTIFICATION

The following are some interesting facts about birds:

1. Some birds cannot fly. They are: the ostrich, penguin, emu, rhea and cassowary.
2. The highest flying bird is the goose. They have been seen flying over the Himalaya Mountains at over 29,000 feet.
3. The fastest flying bird is the common European Swifts which fly as fast as 200 miles an hour.
4. The largest bird is the African Ostrich which may grow 8 feet tall and weigh 300 pounds.
5. The smallest bird is the Cuban Fairy Hummingbird. It is about 2 inches long and weighs about one tenth of an ounce.
6. The fastest runner is the Ostrich which can race at 50 miles per hour.
7. The most dangerous is the Cassowary bird of New Guinea and Australia.
8. The best swimmers and divers include Loons and Gannets. Loons can outswim fish and catch them under water. They have been caught at depths of 160 feet. Fannets dive from heights of 60 to 100 feet.
9. The most intelligent bird is the Crow.
10. The longest lived bird is the Cockatoo which belongs to the parrot family. They have lived as long as 56 years. Geese have lived 30 years.
11. The greatest traveler is the Artic Tern. The Artic Tern flies from the Artic to Antartic, a round trip of 22,000 miles.

BIRD STUDY EXERCISE

Matching - place the letter from Column B after the bird it describes in Column A

Column A	Column B
1. English Sparrow or Starling	a. What bird is a symbol for happiness?
2. Robin	b. What early bird gets the worm?
3. Mocking Bird	c. What bird can fly backward?
4. Catbird or Crow	d. You can tell him by his tail
5. Brown thrasher	e. What bird is an acrobat?
6. King Fisher	f. What bird is the world's best architect?
7. Blue Jay	g. What bird is at ease?
8. Cow bird	h. What bird has a black beard?
9. Humming bird	i. What bird is a mimic?
10. Cardinal	j. What common bird came from England?
11. Red-Headed Woodpecker	k. What bird is a poor mother?
12. Blue Bird	l. What bird is named for a household?
13. Oriole	m. What bird dives for its food?
14. Chickadee	n. What bird is a carpenter?

TEN BIRDS COMMON TO UPPER NEW YORK STATE
(Outline for bird study and identification)

Example: Robin

a. Identifying marks--orange breast, dull yellow beak, dark gray body
b. Unique features (if any) could include calls and care of young. Has a rain call, mating call.
c. Habits and food -- migrates south in winter; seed etc.
d. Nests -- dry grass and mud

1. Song Sparrow
2. Starling
3. Mocking Bird
4. Crow
5. Brown Thrasher
6. Blue Jay
7. Cardinal
8. Oriole
9. Blue Bird
10. Woodpecker

SOME INTERESTING BIRDS TO WATCH FOR ON YOUR CAMPING TRIPS

Permanent Residents - Birds that stay with us all year:

Blue Jay
Sparrow Hawk
White-breasted Nuthatch
Downy Woodpecker
Hairy Woodpecker
Screech Owl
Ruffed Grouse
*Pilgated Woodpecker
*Long-Earred Owl
English Sparrow
Flicker
Black-Capped Chickadee
*Cardinal
*Tufted Titmouse
Pheasant
Screech Owl
Cardinal

*Uncommon or rare

There are many more birds found in Western New York which could be listed under each classification but only birds which have been seen or heard around the camp have been listed.

Summer Residents - Birds that come from the south to raise their young. These birds return South in the Fall. Watch for these on your fall camping trips.

Little Green Heron
Great Blue Heron
Bittern
Spotted Sandpiper
Killdeer
Belted Kingfisher
Hummingbird
Phoebe (leaves Oct. 18)
Wood Pewee (leaves Sept. 18)
Oriole
Field Sparrow
Chipping Sparrow
Indigo Bunting
Scarlet Tanager
Red-Eyed Vireo
Oven Bird
Marsh Wren
Veery
Sora Rail
Blue Birds
Towhee
Red-Winged Blackbird (leaves Nov. 15)
Meadowlark (leaves Nov. 10)
Goldfinch (leaves Nov. 15)
Black and White Warbler
Yellow Warbler
Chestnut-Sided Warbler
Robin (leaves Nov. 5)
Bank Swallows
Cow Birds
King Bird

TRANSIENT VISITANTS - Birds that stop for a few days with us in spring, on the way to their nesting grounds farther north. Again, in the fall, they stop with us on the way to their winter homes in the south:

Short-Eared Owl
Canada Goose
Coot
Myrtle Warbler
Olive-Sided Flycatcher
Semi-palmated Sandpiper
Hermit Thrush (comes Oct. 12-leaves Nov. 4)
Brown Creeper (comes Oct. 10-may stay until May 1)
White-Crowned Sparrow (leaves Oct. 25)
Golden Crowned Kinglet (comes Sept. 20 leaves Nov. 10; may stay for the winter)

WINTER VISITANTS

Horned Lark
Tree Sparrow
Brown Creeper
Black Duck
*Golden-Crowned Kinglet
Slate-colored Junco

*Uncommon or rare

WHERE TO LOOK FOR BIRDS:

I. Look for these birds in fields:

Meadowlark
Bobolink
Vesper Sparrow
Savannah Sparrow
Grasshopper Sparrow
Prairie Horned Lark
Spotted Sandpiper

II. Look for these birds at the edge of the woods:

Field Sparrow
Song Sparrow
Cardinal
Catbird
Brown Thrasher
Chestnut-sided Warbler
Chipping Sparrow
Goldfinch
Kingbird
Junco
Robin
Red-Eyed Vireo
Blue-Jay
Scarlet Tanager
Wood Thrush

III. Look for these birds in orchard or groups of trees:

Oriole
Flicker
Downy Woodpecker
Hairy Woodpecker
Blue Bird
Tree Swallows
Screech Owls
Red-Headed Woodpecker
Chickadee
Red-Eyed Vireo
Wood Pewee
Ruby-Throated Hummingbird
Yellow Warbler
Robin

WHERE TO LOOK FOR BIRDS continued...

IV. Look for these birds in marshes:

Red-Winged Blackbird
Coot
Sora Rail
Marsh Wren
Great Blue Heron
Black Dicks and others

V. Look for these birds in the woods:

Pileated Woodpecker
Oven Bird
Ruffed Grouse
Veery
Hermit Thrush
Towhee
Winter Wren
Golden-Crowned Kinglet
Canadian Warbler
Black and White Warbler
White-Throated Sparrow
Woodcock

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BIRD OBSERVATION CHART